

UNMARKED VERSION OF AMENDMENTS MADE

Please replace paragraph [0001] with the following paragraph.

[0001] This invention relates to a method and system for introducing a predetermined amount of a force compensating material into a wheel/tire assembly for equalizing radial and lateral force variations at the tire/road footprint of a pneumatic tire.

Please replace paragraph [0006] with the paragraph shown below.

[0006] While the use of a compensating material introduced into the interior of the tire has been found to work effectively, either alone or in combination with other balancing techniques, a limitation has been found in how to introduce this material into the tire. In the prior approaches, as depicted in FIG. 3, pulverulent material 20 deposited in mound M is suspended in an air stream and introduced into a tire through a hose line (not shown) and valve stem 14 of tire valve 13 used for inflation of a tire 11. Although such an approach works sufficiently, this method of delivery of a compensating material is in some instances an inconvenient delivery method, and may result in contamination of a work place where a wheel assembly is being balanced. This delivery system has further been utilized in the aftermarket environment to facilitate balancing of replacement tires, and no effective approach to introducing such material into a tire/wheel assembly at original manufacture has been provided.

Please replace paragraph [0033] with the paragraph shown below.

[0033] The particles must have a specific gravity greater than 1 so that they will move positively and as quickly as possible from one place to another in response to external force. It has also been found that the addition of dry powder lubricant or anti-agglomerating agents can significantly increase the effectiveness of the principal particulate material. The dry lubricant acts to coat the interior surface of the tire as well as the primary particulate material particles. In this way particle-particle friction of the particulate material is reduced as is friction at the particulate particle-tire surface interface. The reduced friction allows the particulate material to respond more quickly in equalizing radial and lateral forces acting on the vehicle wheel assembly.

Please replace paragraph [0034] with the paragraph shown below.

[0034] When present in a sufficient amount the dry lubricant serves as a vehicle within which the pulverulent material may freely flow or move laterally and circumferentially within the tire. Further due to the extremely fine particle size of the lubricant, quantities of the lubricant itself may quickly move to positions within the tire in order to equalize radial and lateral forces acting on the vehicle wheel assembly. Other anti-agglomerating agents to function in this manner are also contemplated.

Please replace paragraph [0038] with the paragraph shown below.

[0038] In order to introduce wheel compensating material in the form of agglomerates into a tire in an amount sufficient to equalize radial and lateral forces of a wheel assembly, it is necessary to introduce at least one self-contained batch, and it may be necessary to introduce more than one self-contained batch, as in the form of pellets, or a single self-contained batch, as in the form of a briquette 30. A self-contained batch is preferably sized such that it may be introduced into a tire as one batch (such as a briquette) or in a plurality of batches (such as pellets). The number of self-contained batches required to provide the desired compensation of radial and lateral force variations at the tire/road footprint will in turn be dependent on the characteristics of the tire/wheel assembly 10 as well as the characteristics of the vehicle on which the assembly is to be used. For example, the amount of compensating material required to provide the desired compensation function will increase as the size of the tire increases and as the gross vehicle weight increases. Further, it may be determined that a tire is imbalanced to a certain extent which would require a greater amount of compensating material. Other characteristics of a tire/wheel assembly, such as non-uniformity may also vary the amount of compensating material required. Thus, according to the invention, the self-contained batches of material may be formed in a variety of predetermined sizes to allow the desired amount of material to be easily chosen and introduced into the tire of a particular tire/wheel/vehicle combination simply and effectively. In general, the preferred amount of the preferred compensating material for passenger and light truck vehicles is in a range of 0.20-2.0 ounces while larger vehicles may use a larger amount, such as between 1.5-24 ounces. These amounts may vary depending on particular characteristics of the tire/wheel/vehicle. More particularly, the following ranges of the preferred compensating material are generally found to be effective for the following tire sizes. For a 13" tire/wheel, an amount of compensating material for

incorporation therein may range from about 0.2-0.6 ounces. A 14" tire/wheel may require an amount of compensating material in the range from about 0.4-0.9 ounces, while a 15" tire/wheel may require between 0.8-1.4 ounces. For a 16" tire/wheel, the amount of compensating material that may be required may range from about 1.0-1.7 ounces, while a 17" tire/wheel may require an amount in the range from about 1.2-2.0 ounces. For truck tires, the amount of compensating material that would be desired for compensating radial and lateral force variations may lie in the range between 2.0-6.0 ounces. Again, depending on the material itself as well as the characteristics of the tire/wheel/vehicle, the amount of material desired may vary. In general, the amount of material is sufficient to balance a wheel assembly and compensate for radial and lateral force variations at the footprint. Thus, as tires of any size, ranging from passenger car tires to truck tires, can be treated with a composition according to this invention for the purpose of balancing a wheel assembly and/or equalizing load forces. The amount (or weight) of powdered material per tire to be used will vary over a wide range, depending on the size of the tire and the amount that the tire is out of balance, whether this amount be expressed as a suitable range or as an optimum amount. A suitable amount of material to be used can be determined empirically, and indeed may require determination empirically, since the amount that a tire is out of balance is determined empirically.

Please replace paragraph [0045] with the paragraph shown below.

[0045] The compositions above described may be formed by known procedures. Pellets, briquettes and other agglomerates or extrudates according to this invention may be made of any convenient size and shape. Pellets are typically either spherical or ellipsoidal. Briquettes are

typically pillow shaped as shown in Fig. 5. Extrudates are typically cylindrical. None of these shapes is critical. Size also is not critical, except that an agglomerate should be no larger than is necessary to contain wheel compensating material sufficient to charge a given tire size using one self-contained batch. An agglomerate can be small enough to permit charging of a plurality of self-contained batches.

Please replace paragraph [0046] with the paragraph shown below.

[0046] In another embodiment as shown in Fig. 6, a self-contained batch of particulate wheel compensating material is made in the form of a bag 40 containing free flowing compensating material. A bag is also suitable as a self-containment form for liquid and liquid/solid materials. A bag is preferably made of a material that will abrade, tear or shred upon rotation of an assembled wheel. Suitable materials include generally paper and plastic. In Fig. 6, the bag 40 is designed to contain a predetermined amount of compensating material to allow shipping, handling and charging of a tire/wheel assembly without substantial loss of material, and then to break down to release the free-flowing particles or other material. In an embodiment of bag 40, a paper material may be used to form bag 40 in a conventional manner using form, fill and seal equipment. In such equipment, bag 40 is produced with an initially open top, the compensating material is placed therein, and the top is then sealed. In a particular example, a 20 lb. paper was used to form bag 40, with the edges thereof hot sealed using a 5 lb. low density polyethylene glue. Other paper weights or glues may also be suitable for a given tire/wheel assembly. Thus a bag of compensating material is self-contained in that it will retain substantially all of the material batch in the bag until the bag is transferred into a tire.

Please replace paragraph [0048] with the paragraph shown below.

[0048] In a further embodiment of a self-contained batch using a container such as a bag 40 for the free-flowing material, may also use perforations 48 in the bag material (whether paper or polymeric) if desired, to facilitate shredding of the bag 40 and release of the compensating material. Such perforations can be formed using conventional perforating equipment. It should be understood that any such perforations would have to be of a character to not allow the escape of material from within the bag 40 until bag 40 has been charged into a tire. The perforations, or microperforations, if any, are sufficiently small to prevent loss of wheel compensating material through the perforation holes, but also facilitate shredding of the bag 40 upon rotation of the tire.

**In the Claims:**

Replace the following claims with the claims shown:

1. (Amended) A method for introducing a compensating material into a tire/wheel assembly comprising the steps of:
  - providing a tire;
  - providing at least one bag of compensating material;
  - transferring said at least one bag of compensating material into an interior of said tire;and
  - mounting said tire on a wheel to form a tire/wheel assembly;